

DESIGN IN ILLUMINATION.

Principes de la Technique de l'Éclairage. By Dr. L. Bloch. Translated by G. Roy. Pp. 183. (Grenoble: Jules Rey; Paris: Gauthier-Villars, 1911.) Price 5 francs.

THIS book is a translation of Dr. L. Bloch's "Grundzüge der Beleuchtungstechnik," and although an interval of four years separates the original from the translation, the work was worth doing, as the admirable treatment accorded the subject by Dr. Bloch will secure a prominent place for his treatise in the literature of the subject for a long time to come.

The subject-matter is in strict accordance with the title, a condition not too closely observed in some text-books on illuminating engineering. The author has devoted his attention almost entirely to the development of methods of design of lighting installations from given data, whereby the results in illumination and costs can be predicted with a reasonable degree of certainty.

In the first chapter fundamental quantities and their relations are clearly and accurately dealt with, the idea of luminous flux in particular being elucidated by a material analogy, which will carry conviction to a far larger number of readers than will the hardly worked analogy with magnetic flux. The author uses throughout the photometric notation of the Geneva Congress of 1896.

Methods for the determination of mean spherical intensity from polar curves of intensity are briefly described in the second chapter, including the author's modification of Rousseau's construction, which adapts it for rapid calculation, but the equally convenient graphical method due to Kennelly is not mentioned.

Some general considerations with regard to exterior and interior lighting bring the third chapter to a conclusion, great stress being rightly laid on the importance of mean horizontal illumination as a factor in design.

The real business of the book begins in the fourth chapter. A method is here given by which the integral of the Rousseau curve for a given light source over the lower hemisphere is made to supply material for a table of total luminous flux emitted under any angle from the vertical to the horizontal.

A number of such curves are developed, each from the average polar curve of luminous intensity of a specified type of source, and all being reduced to the same value of mean spherical intensity. With the help of these tables, the cosine law, and some experimental data on reflection coefficients obtained by the author, a complete method of design is elaborated, applicable to most conditions in modern lighting. The author's justification for

his broad generalisations and approximations appears from the comparatively close agreement existing between his observed and calculated values of illumination in examples taken from his practice in the street lighting of Berlin.

Photometry is dismissed at the beginning of the fifth chapter with little more than a description of the Brodhun illumination photometer as used by the author on the Berlin streets. This is followed by a description of a method for reducing to a minimum the number of street observations necessary for the determination of the value of the mean horizontal illumination.

The sixth and last chapter is devoted to indirect lighting, and, in spite of obvious difficulties, it is shown from actual examples that the formulæ and methods already devised are still able in certain cases to give fairly accurate results. It is not easy, however, to follow the author in his contention that the difference in cost between direct and indirect lighting for a given effect achieved may be in many cases of very small moment.

The book is a successful attempt to place the design of illuminating installations in a position comparable with that held by design in other branches of engineering.

THE FACE OF THE EARTH.

La Face de la Terre. By Prof. Ed. Suess. Vol. iii., pt. 2. Pp. xii + 531-956, 2 maps, 124 figs. (Translated under the direction of E. de Margerie.) (Paris: Armand Colin, 1911.) 12 frs.

THE present instalment of the French edition of Prof. Suess's great work includes only the first half of the final volume. It consists of translations of chapters x.-xvi., which deal with the western representatives of the Altiid mountain system of Prof. Suess, and with the Alps, Atlas, and various related mountains, which are all attributed to foldings within areas surrounded by an Altiid framework. The last chapter deals with the North Atlantic area, including Iceland and Greenland.

As the original has already been reviewed in NATURE, it is unnecessary to reconsider the problems dealt with in the work. The chapters have been translated by MM. H. Baulig, Ch. Jacob, and P. Lemoine; the volume is edited by M. de Margerie, who is to be warmly congratulated on the great service he has made to students of Prof. Suess's work by this accurate and scholarly translation, and by the issue of this well-illustrated edition of the book.

The study of the work requires such frequent reference to geological maps, of which the original edition contains so few, that it is difficult to read except in a geological library. M. de Margerie's

edition is, however, so richly illustrated by excellent maps and sections that the book is complete within itself. The German edition of the part here translated is illustrated by one plate and twenty-three figures. To these, M. de Margerie has added three plates and 101 figures, and, as many of them have been redrawn for this edition, they are often clearer than the originals. Moreover, many new additional references have been added and occasional explanatory notes, which are all enclosed within square brackets. Amongst these additions the bibliography of the Caucasus and the footnotes on Algeria are especially useful. Among the most important of the new illustrations is a valuable coloured geological map of the western Atlas. M. de Margerie's edition forms an atlas of diagrammatic sketch maps of the countries discussed. The maps are artistically excellent, but they sometimes follow the current, but inconvenient, practice of translating place names. It is no doubt difficult to decide when the translated form of a proper noun has become so widely used that it would be pedantic not to accept it. Nevertheless, it would be generally convenient if the number of such place-names were restricted as far as possible. Thus, such cases as the use of *Terre de Grant* for Grant Land render the index less useful to foreign students, and the adoption of *François*, instead of *Franz*, for a locality named after the Austrian Emperor tends to conceal the history of the name.

J. W. G.

DARWINISM IN THE LIGHT OF MODERN RESEARCH.

Die Abstammungslehre: Zwölf gemeinverständliche Vorträge über die Deszendenztheorie im Licht der neueren Forschung. By O. Abel, A. Brauer, and others. Pp. iv+489. (Jena: Gustav Fischer, 1911.) Price 11 marks.

THE handsome volume issued by the Society for Natural Science in Munich (*Münchener Verein für Naturkunde*) is a striking proof of the breadth of Darwin's knowledge and of the many-sided character of his researches. The volume contains twelve papers relating to subjects dealt with by Darwin in establishing his theory of evolution; but while Darwin dealt with all of them single-handed, each of the contributions to this volume is the work of an expert. The first paper, an introduction to our present knowledge of evolution, is written by Prof. Richard Hertwig, of Munich, who gives a very clear account of the work and beliefs of Darwin's predecessors, especially of Cuvier's position as regard evolution. The second and third papers are written by Prof. Richard Goldschmidt, of Munich, and relate to

the origin of species in the light of our present knowledge of heredity. In the fourth, by Prof. Richard Semon, the inheritance of acquired characters is discussed; the author thinks these may be inherited, but he employs the term inheritance in a limited sense. In the fifth, Dr. Paul Kammerer, of Vienna, recapitulates the chief facts in support of Darwin derived from experiments in breeding. The position of natural selection as a factor in evolution is the subject of the sixth paper, by Prof. Franz Doflein, of Munich.

Prof. August Brauer, in the seventh paper, gives the evidence arising from our modern knowledge of the geographical distribution of animals; while the additional evidence afforded by modern palæontology by Dr. Edgard Dacqué, of Munich, constitutes the eighth paper. Prof. Abel, of Vienna, writes the ninth paper, and describes the various fossil forms which have been discovered since Darwin's time, and their bearing on our knowledge of the evolution of the higher vertebrates. The bearing of recent discoveries in comparative anatomy on the theory of descent is related by Prof. Otto Maas, of Munich (tenth paper); while Prof. Karl Giesenhagen writes the eleventh, on the evolution of plant forms.

The last and twelfth paper occupies a third of the volume. It is written by Prof. Hermann Klaatsch, of Breslau, and is entitled by him "The Place of Man in Nature." Prof. Klaatsch, who deals with the descent of man, unlike the other contributors to this volume, is not content by a mere statement of the progress made since 1871; he brings forward a new genealogical tree for man and the anthropoid apes. Like Darwin, he regards man as derivative of the same stem as the anthropoid apes, but differs in supposing that man has retained the characters of the common stock to a greater degree than the anthropoids have.

Those who wish to examine a full statement of Prof. Klaatsch's theory of man's origin will find it here. In Prof. Klaatsch's opinion, the modern population of Europe is formed by the mixture of at least two stocks; one of these was evolved in common with the orang and entered Europe through Asia, while another human stock was evolved in common with the gorilla and entered Europe from Africa. In this way he accounts for the two prevailing types of nose among modern Europeans. The prominent or "Grecian" nose he supposes to be derived from the human "gorilloid" stock, while the 'australoid' nose—of which he cites Darwin's nose as an example—came into Europe by the Eastern or "orangoid" stock. It is difficult to believe that Prof. Klaatsch is really quite serious in his contribution to "Die Abstammungslehre."

A. K.